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IS 3147 (1992): Oil of Dill Seed [PCD 18: Natural and Synthetic Fragrance Materials]



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“Knowledge is such a treasure which cannot be stolen”

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IS 3147 : 1992

REAFFIRMED

2006

भारतीय मानक

सोआ के बीजों का तेल — विशिष्ट

(पहला पुनरीक्षण)

Indian Standard

OIL OF DILL SEED — SPECIFICATION

(*First Revision*)

UDC 665.526.882

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

September 1992

Price Group 2

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Natural and Synthetic Perfumery Materials Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

This Indian Standard was first published in 1965. In this revision, Type 1 oil of dill — herb, has been deleted as it is no longer available for commercial usage. Besides, all the requirements of oil of dill seed have been updated keeping in line with the current quality of the material available. GC method of analysis has been incorporated in this revision for the purpose of guidance only under Annex A.

Anethum sowa D.C. Roxb., fam. Umbelliferae, the sowa plant, which is erroneously regarded to be a variety of *Anethum graveolens* Linn. syn. *Peucedanum graveolens* Linn., is a glabrous, hapaxanthic, annual herb occurring throughout tropical and sub-tropical India during winter. The herb is strongly scented and is cultivated mainly in the plains of the Punjab in India. It is a native of the Orient and Mediterranean countries, growing wild in various parts of Europe, including Southern Russia and in Africa and Asia. It is also cultivated in the United States, Hungary, Germany and England. The entire plant is aromatic, but most of the volatile oil is contained in the seed (fruit). Dill leaves are extensively employed for culinary purposes, while the seed is employed as a condiment. The bulk of the oil is used as a flavouring agent in food industries besides its use in pharmaceutical and perfumery industries.

The essential oil can be extracted by steam distillation from the overground parts including the immature fruit (oil of dill herb) and from the mature and separated fruit (oil of dill seed). The oil of dill herb (also inaptly called oil of dill weed), is no longer available which was earlier extensively used by the food industry because of its more characteristics herbal flavor.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (revised)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

**AMENDMENT NO. 1 JANUARY 1999
TO
IS 3147 : 1992 OIL OF DILL SEED —
SPECIFICATION**

(First Revision)

(Page 2, clause A-1, line 10) — Substitute '3 m' for '1.82 m'.

(Page 2, clause A-2) — Delete.

(Page 3, Fig. 1) — Substitute 'LIMONENE' for 'LIMONE'.

(PCD 18)

Reprography Unit, BIS, New Delhi, India.

Indian Standard

OIL OF DILL SEED — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and tests for oil of dill seed.

2284 : 1988

Method for olfactory assessment of natural and synthetic perfumery materials (*first revision*)

6597 : 1988

Glossary of terms relating to natural and synthetic perfumery materials (*first revision*)

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard :

IS No.	Title
326	Methods of sampling and test for natural and synthetic perfumery materials:
(Part 1) : 1984	Sampling (<i>second revision</i>)
(Part 2) : 1980	Preliminary examination of perfumery materials and samples (<i>second revision</i>)
(Part 3) : 1980	Determination of relative density (<i>second revision</i>)
(Part 4) : 1980	Determination of optical rotation (<i>second revision</i>)
(Part 5) : 1986	Determination of refractive index (<i>second revision</i>)
(Part 6) : 1986	Determination of solubility (<i>second revision</i>)
(Part 8) : 1980	Determination of ester value, content of esters and combined alcohols (<i>second revision</i>)
(Part 9) : 1980	Determination of ester value, after acetylation and free alcohols (<i>second revision</i>)
(Part 11) : 1986	Determination of carbonyl value and content of carbonyl compounds (<i>second revision</i>)
1070 : 1992	Reagent grade water — Specification (<i>third revision</i>)

The above mentioned standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated above.

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 6597 : 1988 shall apply.

4 REQUIREMENTS**4.1 Description**

Oil of dill-seed shall be obtained by steam distillation of the mature crushed seeds of the herb *Anethum sowa* D.C. Roxb., fam. Umbelliferae.

The oil shall be a clear liquid, free from sediment, suspended matter, separated water and adulterants.

4.2 Solubility

The material shall be soluble in 0.5 and more volumes of ethyl alcohol (90 percent by volume) when tested as prescribed in IS 326 (Part 6) : 1986.

4.3 The material shall also comply with the requirements given in Table 1.

Table 1 Requirements for Oil of Dill Seed

Sl No.	Characteristics	Requirements	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Color and appearance	Pale yellow liquid darkens on keeping	IS 326 (Part 2) : 1980
ii)	Odour	Fresh green spicy with a strong camphoraceous top-note	IS 2284 : 1988
iii)	Relative density at 27/27°C	0.936 0 to 0.980 0	IS 326 (Part 3) : 1980
iv)	Refractive index at 27°C	1.475 0 to 1.487 0	IS 326 (Part 5) : 1986
v)	Optical rotation	+50° to +65°	IS 326 (Part 4) : 1980
vi)	Ester value, before acetylation	35 to 42	IS 326 (Part 8) : 1980
vii)	Ester value after acetylation	50 to 65	IS 326 (Part 9) : 1980
viii)	Total ketone content calculated as carvone percent by mass, Min	35	IS 326 (Part 11) : 1986

The material shall be supplied in air tight well-closed containers permitting a minimum of air space, as agreed to between the purchaser and the supplier.

5.2 Marking

a) Name of the material;
b) Indication of source of manufacture;

- ## 6 SAMPLING

7 TESTS

Tests shall be conducted as prescribed in 4.1, 4.2 and col 4 of Table 1.

7.1 Quality of Reagents

Unless otherwise specified, pure chemicals and distilled water (see IS 1070: 1992) shall be employed in tests.

ANNEX A

(*Foreword*)

GAS CHROMATOGRAPHIC ANALYSIS OF OIL OF DILL SEED

A-0 GENERAL

A-0.1 Outline of the Method

A sample of the material is dissolved in a suitable solvent (for example, hexane, cyclohexane or petroleum ether) and is injected into the gas chromatograph where it is carried by the carrier gas from one end of the column to the other. During its movement, the constituents of the sample undergo distribution at different rates and ultimately get separated from one another. The separated constituents emerge from the end of the column one after another and are detected by suitable means whose response is related to the amount of a specific component leaving the column.

A-1 APPARATUS

Any suitable gas chromatograph and column capable of being operated under conditions suitable for resolving the individual constituents into distinct peaks may be used. The typical chromatogram for oil of dill seed with the following chromatographic conditions is shown in Fig. 1.

Carrier Gas

Nitrogen

Conditions

Column temperature	170°C
Injection port temperature	250°C

Detector

Type	F.I.D.
Temperature	250°C

A-2 CALCULATION

A-2.1 Area Measurement (see Note)

Since normal peaks approximate a triangle, the area is measured by multiplying the peak height times the width of half height. The normal peak base is not taken since large deviations may be observed due to tailing or adsorption. This technique is rapid, simple and fairly accurate when peaks are symmetrical and of reasonable width.

A-2.2 Area Normalization

By normalizing, it is meant, calculating the percentage composition by measuring the area of each and dividing the individual areas by total area, for example :

$$\text{Percentage of A} = \frac{\text{Area of A}}{\text{Total Area}} \times 100$$

NOTE — Other methods of area measurements, namely, triangulation, disc integrator and electronic digital integrator if fixed with GC machine, would be of great advantage.

<i>Sample</i>	<i>Oil of Dill Seed</i>
<i>Column</i>	
Material	Stainless steel
Length	1.82 m
Orifice	0.63 cm
Stationary phase and solid support	SE-30 Chromosorb WHP, 100-120 Mesh

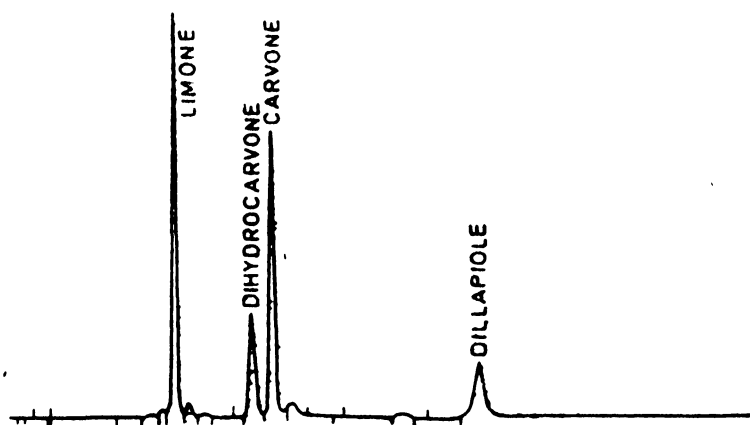


FIG. 1 A TYPICAL CHROMATOGRAM FOR OIL OF DILL SEED

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